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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/021,148	12/12/2001	Yeong-Taeg Kim	SAM2.0007	2503

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KENNETH L SHERMAN ESQ
MYERS DAWES ANDRAS & SHERMAN LLP
19900 MACARTHUR BLVD
11th floor
IRVINE, CA 92612

EXAMINER

PERUNGAVOOR, SATHYANARAYA V

ART UNIT	PAPER NUMBER
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2625

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/021,148	KIM, YEONG-TAEG	
	Examiner	Art Unit	
	Sath Perungavoor	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/12/2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 6-9 is/are rejected.
- 7) ☒ Claim(s) 2-5 and 10-12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>12/12/2001</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1 Figure 4 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2 Claim 5 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 4. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim 12 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 11. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is

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proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claims 3-4 and 10-11 are objected to because of the following informalities:

$x(m,n)$, $y(m,n)$, $f_L(m,n)$, $f_R(m,n)$, $f_U(m,n)$ and $d(m,n)$ are not described completely, a detailed description of their functionality is needed. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3 The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Song (U.S. Patent Number 5,038,388)

Regarding claims 1, Song discloses a method for enhancing an image, which comprises (Figs. 1-2, Col. 2 Lines 15-17):

obtaining a first image signal including pixel values (Fig. 1, Step 200 in Fig. 2, Col. 2 Lines 15-17, Col. 6 Line 66 to Col. 7 Line 6);

obtaining a high-pass image signal having high-frequency components of the first image signal (Col. 7 Lines 17-20);

obtaining a positive non-zero weighting factor to control a degree of enhancement (Col. 7 Lines 21-22);

selecting edge pixel values representing a boundary of an edge in the first image (Col. 7 Lines 2-6, Col. 2 Lines 6-7; It is also inherent that edge enhancing would entail selecting edge pixel values representing the boundary of an edge);

for suppressing shoots, defining a gain suppressing function having attenuation coefficients to be multiplied with particular pixel values of the high-pass image signal corresponding in location to the edge pixel values (Col. 9 Lines 19-20; The definition in the cited reference is a replica of the shoot suppressing function disclosed in the claimed invention);

multiplying the high-pass image signal by the weighting factor and by the gain suppressing function to obtain a result and (Multiplier 110 in Fig. 1, Col. 9 Line 28);

adding the result to the first image signal to obtain an enhanced image signal in which the shoots have been suppressed (Adder 20 in Fig. 1, Col. 9 Line 36).

Regarding claim 6, Song discloses a method according to claim 1, wherein the edge extends in a horizontal direction (Figs. 3E-3H; It is also common knowledge in the art that edges of an image extend in the horizontal direction).

Regarding claim 7, Song discloses a method according to claim 1, wherein the edge extends in a vertical direction (Figs. 3E-3H; It is also common knowledge in the art that edges of an image extend in the vertical direction).

Regarding claim 8, Song discloses a method according to claim 1, wherein the step of obtaining the high-pass image signal includes filtering the first image signal (Col. 7 Lines 17-20; It is also common knowledge in the art that the high-pass image signal entails filtering the image signal).

4 Claims 1 and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Scognamiglio, Ramponi, Rizzi and Albani, "A Rational Unsharp Masking Method for TV Applications", 1999 (Herein after referred to as Scognamiglio)

Regarding claim 1, Scognamiglio discloses a method for enhancing an image, which comprises (Page 248, Figure 1):

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obtaining a first image signal including pixel values (Page 248, Figure 1; $s(n,m,t+1)$ denotes the obtained image signal with pixel values);

obtaining a high-pass image signal having high-frequency components of the first image signal (Section 2; It is also common knowledge in the art that a high-pass image signal would have high frequency components of the image signal);

obtaining a positive non-zero weighting factor to control a degree of enhancement (Section 2.1; λ disclosed in cited reference performs the same function as the weighting factor of the claimed invention);

selecting edge pixel values representing a boundary of an edge in the first image (Section 2; It is also inherent that edge enhancing would entail selecting edge pixel values representing the boundary of an edge);

for suppressing shoots, defining a gain suppressing function having attenuation coefficients to be multiplied with particular pixel values of the high-pass image signal corresponding in location to the edge pixel values (Section 2.1;

The definition in the cited reference is a replica of the shoot suppressing function disclosed in the claimed invention);

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multiplying the high-pass image signal by the weighting factor and by the gain suppressing function to obtain a result and (Section 2.1; The cited reference definition $u_s(n,m,t)$ is a replica of the claimed invention);

adding the result to the first image signal to obtain an enhanced image signal in which the shoots have been suppressed (Section 2; cited art discloses an improvement on claimed invention and subtracts temporal operator to further reduce the noise. This improvement does not compromise the original function and hence can be removed if needed. If removed $u(m,m,t)$ would be an exact replica of the claimed invention).

Regarding claim 6, Scognamiglio discloses a method according to claim 1, wherein the edge extends in a horizontal direction (Section 2.1; It is also common knowledge in the art that edges of an image extend in the horizontal direction).

Regarding claim 7, Scognamiglio discloses a method according to claim 1, wherein the edge extends in a vertical direction (Section 2.1; It is also common knowledge in the art that edges of an image extend in the vertical direction).

Regarding claim 8, Scognamiglio discloses a method according to claim 1, wherein the step of obtaining the high-pass image signal includes filtering the first image signal (Section 2; It is also common knowledge in the art that the high-pass image signal entails filtering the image signal).

Claim Rejections - 35 USC § 103

5 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 9 rejected under 35 U.S.C. 103(a) as being unpatentable over

Scognamiglio

The method according to claim 1, wherein the gain suppressing function inherently performs the step of selecting the edge pixel values.

Scognamiglio discloses the gain suppressing function and the selecting of edge pixel values as set forth in the discussion of claim 1.

Scognamiglio does not disclose expressly the gain suppressing function inherently performing the step of selecting the edge pixel values.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to create a gain suppressing function that inherently performs the step of selecting the edge pixel values to combine multiple functions into one comprehensive function.

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Claim 9 rejected under 35 U.S.C. 103(a) as being unpatentable over Song

The method according to claim 1, wherein the gain suppressing function inherently performs the step of selecting the edge pixel values.

Song discloses the gain suppressing function and the selecting of edge pixel values as set forth in the discussion of claim 1.

Song does not disclose expressly the gain suppressing function inherently performing the step of selecting the edge pixel values.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to create a gain suppressing function that inherently performs the step of selecting the edge pixel values to combine multiple functions into one comprehensive function.

Allowable Subject Matter

6 Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Claims 3,4,10 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten to overcome the objections set forth in this office action and in independent form including all of the limitations of the base claim and any intervening claims.

Other Prior Art Cited

7 The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Liu (U.S. 5,880,767) discloses a method for image enhancement and shoot reduction using high pass filtering.

Lee (U.S. 6,285,798) discloses a method for image enhancement using edge dependent gain control signal and high pass filtering

Contact Information

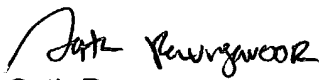
8 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sath Perungavoor whose telephone number is (703) 306-4116. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta whose telephone number is (703) 308-5246, can be

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reached on Monday to Friday from 9:00am to 5:00pm. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Sath Perungavoor


KANJI BHAI PATEL
PRIMARY EXAMINER